

ABSTRACT

The invention relates to a computer system and method for simulating transport phenomena in a complex system. The computer system comprises memory means, storage means, and an object-oriented software product. The software product comprises an object-oriented extensible class hierarchy comprising a first set of generic classes that represent a plurality of object types and a second set of generic classes that represent member variables for the object types. The extensible class hierarchy permits the addition of additional object types or additional member variables without any modifications to the class hierarchy itself. The invention is particularly useful in simulating a hydrocarbon system that may include one or more of the following: a subterranean hydrocarbon-bearing formation, injection wells that penetrate the formation, production wells that penetrate the formation, surface flowlines, associated aquifers, and surface fluid processing facilities.